

CLAIM AMENDMENTS

IN THE CLAIMS

This listing of the claims will replace all prior versions, and listing, of claims in the application or previous response to office action:

1. **(Currently Amended)** A method of determining the original amount of nitrogen in a gas mixture, the mixture also containing at least one hydrocarbon constituent, comprising

ionizing the gas mixture, by introducing energy into the gas ~~using one of the following processes: subjecting the gas to a thermalizing electrical arc, by subjecting the gas to a nonthermal plasma discharge, or subjecting the gas to a catalyst;~~

controlling the amount of energy introduced into the gas, such that nitrogen atoms in the gas and hydrogen atoms from at least one hydrocarbon constituent of the gas are dissociated and reform to ammonia;

wherein the energy is sufficient for dissociation of the nitrogen but insufficient for dissociation of methyl;

measuring the amount of ammonia in the gas;

wherein the ionizing and controlling steps are performed by routing the gas mixture through a nonthermal plasma discharge chamber, and wherein the measuring step is performed by subsequently routing the gas into a nondispersive infrared absorption detection chamber; and

estimating the original amount of nitrogen in the gas mixture, based on the amount of ammonia measured in the preceding step.

2. **(Original)** The method of Claim 1, wherein the gas mixture is a natural gas mixture.

3. **(Original)** The method of Claim 1, wherein the hydrocarbon constituent is methane.

4-5. (Cancelled)

6. (Currently Amended) The method of Claim [[5]] 1, wherein the energy is controlled such that it is insufficient to ionize constituents having higher bond strength than that of nitrogen.

7. (Cancelled)

8. (Original) The method of Claim 1, wherein the measuring step is performed using infrared absorption techniques.

9. (Original) The method of Claim 8, wherein the infrared absorption is performed at a wavelength of 10.34 micrometers.

10. (Original) The method of Claim 8, wherein the infrared absorption is performed at a wavelength of 10.74 micrometers.

11. (Cancelled)

12. (Original) The method of Claim 1, further comprising the steps of repeating all steps for successive samples of the gas mixture.

13. (Original) The method of Claim 12, wherein the repeating steps are consistent with each other.

14-24. (Cancelled)

25. (Cancelled)

26. (Original) The method of Claim 1, wherein the estimating step is performed by correlation of the measured amount of ammonia to the original amount of nitrogen in the gas.

27. (Original) The method of Claim 1, wherein the controlling step is performed such that substantially all of the nitrogen is reformed into ammonia.